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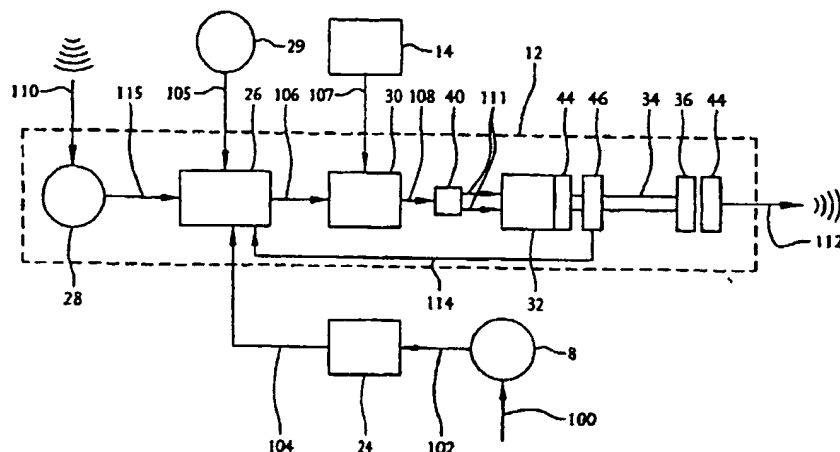
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(54) Abstract Title

Method and apparatus for transmitting information to the surface from a drill string down hole in a well

(57) A method and apparatus for transmitting information to the surface from down hole in a well in which a pulser (12) is incorporated into the bottom hole assembly of a drill string that generates pressure pulses (112) encoded to contain information concerning the drilling operation. The pressure pulses (112) travel to the surface where they are decoded so as to decipher the information. The pulser (12) includes a stator (38) forming passages through which drilling fluid flows on its way to the drill bit. The rotor (36) has blades that obstruct the flow of drilling fluid through the passages when the rotor (36) is rotated into a first orientation and that relieve the obstruction when rotated into a second orientation, so that oscillation of the rotor (36) generates the encoded pressure pulses (112). An electric motor (32), under the operation of a controller (26), drives a drive train that oscillates the rotor (36) between the first and second orientations. The controller (26) may receive instructions for controlling the pressure pulses characteristic from the surface by means of encoded pressure pulses transmitted to the pulser (12) from the surface that are sensed by the pressure sensor (29) and decoded by the controller (26).



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